



PURIFICATION (SHODHANA) PROCEDURES IN AYURVEDIC PHARMACEUTICS

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ABSTRACT

Ayurveda encounters various types of raw materials such as herbs, minerals, animal products, synthetic chemicals etc. for manufacturing of medicines and pharmaceuticals. In ayurvedic pharmaceuticals, shodhana (purification/processing) is a pre pharmaceutical procedure either to nullify the toxic effect or to enhance the positive attributes of the drug. Herbs as well as minerals bear with toxicity either due to specific nature of ingredients or by the specific stage of existence in some phytochemical parameters. So, it is essential to convert them into nontoxic pharmacologically active ingredient or to nullify the adverse actions.

Aims and objectives: To review the pharmaceutical significance and necessity of the specific process (shodhana) and its need.

Varieties of shodhana: It can be classified into two types samanya (general) and vishesha shodhana (specific).

Conclusion: purification is an essential procedure to nullify the toxic effects of drugs prior to medication. This enhances safety as well as efficacy.

KEY WORDS: shodhana, purification.

Introduction

Ayurveda encounters various types of raw materials such as herbs, minerals, animal products, synthetic chemicals etc. for manufacturing of medicines and pharmaceuticals. In ayurvedic pharmaceuticals, shodhana (purification/processing) is a pre pharmaceutical procedure either to nullify the toxic effect or to enhance the positive attributes of the drug. Some of the drugs bear with toxic character which should be nullified or deactivated by different pharmaceutical process. During classical age itself or from time immemorial these practices are evenly conducted for the benefits of living kingdom. Avoiding the shodhana process not only creates toxic effect but also the therapeutic values are also being arrested.

Definition:

The literary meaning of Shodhana is cleaning or purification. Any raw drug when subjected to certain maneuver like grinding etc in the presence of prescribed media to remove its impurities is termed as shodhana in classical texts¹. Two types of shodhana are there. Samanya shodhana (General purification) and vishesha shodhana (specific purification).

Need of shodhana:

Its significance is to nullify the toxic material or to convert the toxic forms into nontoxic form. The adverse effects are due to visible or insignificant impurities, its physical state and presence of heterogeneous materials.

Aim of shodhana:

It is a multi targeted process not only to remove the physical or chemical impurities but also to enhance the bioavailability and efficacy.

Objectives of shodhana:

Depending upon the nature of the raw drug, specific shodhana method is mentioned in the classical texts for each and every raw drug. Eliminating physical and chemical impurities, neutralization of toxins, to induce and enhance therapeutic qualities, to make the drug suitable for administration, to facilitate further processes like marana (incineration), etc. are some of the objectives of shodhana.

1. Elimination of physical and chemical impurities:

Most of the raw drugs are of natural origin; hence they may contain adulterants like sand, plant debris, unwanted minerals etc. This can be removed by the process of shodhana. For example in case of the drug shilajatu (Asphaltum punjabinum) it is washed in alkaline/sour/acidic liquid medium to separate the impurities². To remove tin and lead, mercury is subjected to sublimation and condensation process³.

2. Neutralizes the toxins:

Some of the drugs such as kupidu (strichnous nuxvomica), tamra (copper), haratala (arsenic trisulphide) etc. are toxic in nature. Seeds of strichnous nuxvomica can be purified by frying in ghee and removing its external layer and plumule. By this strichnine is inactivated along with conversion to nontoxic form and also retard the absorption rate beyond therapeutic level⁴.

3. Enhances bioavailability or therapeutic qualities of the drug:

Bioavailability is enhanced by converting to aqueous soluble form or beyond barrier level into lipid soluble form⁵.

4. It enhances porosity of particles and hence surface area, thereby facilitating the drug for further processes.

For the processes like incineration, trituration etc we have to get the drug in powder form. So to make the drugs fit for further process, shodhana is carried out. In case of metals like iron, copper the purification procedure is heating till red hot and dipped in specific liquid. This makes the metal brittle and helps in further processing⁶.

5. To impart thermal stability:

By repeating the purification process of sulphur crystallography will be changed by which thermal stability is increased. The crystalline size was changed after shodhana which is thermally stable⁷.

METHODOLOGY:

One of the purification procedures is bhavana that is grinding the material with selected liquid material which not only converts toxic form to nontoxic form but also enhances bioavailability. Similarly by boiling or mixing seeds of dhatura (Datura alba) in butter milk or curd inactivate the atropine like material in it. The Shodhana process resulted in reduction in hyoscyamine content, whereas scopolamine content reduced almost to zero¹². This also reduces the bioavailability of toxic material. Vatsanabhi (Aconitum ferox), when treating with cows urine, also undergo similar changes during shodhana. In semicarpus Anacardium one of the methodology is mixing the pieces of the seed with brick powder which absorb the resinous exudate resulting in the quantitative reduction of active principles present in it. When boiling with cow's urine the toxic forms are converted to beneficial forms¹³. Various methodologies prevalent in the context of shodhana are briefed in Table 1.1

Table 1.1 Let us have a bird's eye view regarding various methodologies prevalent in the context of shodhana. (Table 1.1)

Sl. No.	Name of the process	methodology	significance	example
1.	swedana	Boiling of raw material in selected liquid medium	Removal of volatile impurities or conversion to nontoxic form.	Commiphora mukul: Resinous exudates become porous to facilitate removal of impurities and convert bursene into absorbable form. In the case of arsenic trisulphide it is preserved by removal of other thermo liable arsenic compounds ⁸ .

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2.	Mardanam	Tritururation with out liquid ingredients	To segregate homogenous ingredients followed by separation.	Liquid mercury uniquely combines by removing other materials like dust, unamalgamated substances etc.
3.	bhavana	Trituration with liquid media	Particle size reduces along with conversion to suggested form to others	Trituration with ginger juice converts other form to trisulphide form and particle size reduces enhancing surface area ⁹
4.	patana	Distillation and condensation	Separation of volatile/ingredients from non volatile matter	Purification of mercury or extraction of volatile oil from herbs.
5.	dhalana	Melted slag or metals are dipping in cold liquid medium	Separation of adulterants and reducing brittleness	Purification of sulphur or shodhana of tin and lead.
6.	prakshalanam	Washing in a current of water	Removes dust /light particles and other foreign bodies	Shodhana of kampillaka(mellitus philippinus)
7.	Nimrnjana	dipping raw drug in selected liquid medium	Either to nullify toxins or to convert to non toxic form	Dipping plumbago zeylanicum in lime water solution converts plumbajin to non toxic form by nullifying the acidic nature ¹⁰
8.	Bharjanam	frying	Heating kamshi (alum) removes water of crystallization	Converting double sulphate to dehydrated form become fragile and powdery ¹¹

There are other methods like dissolution and recrystallization is being practiced as in the case of soraka lavana. Soraka lavana exist as potassium nitrate will be reduced to potassium nitrite. This can be removed by dissolution in water and slow crystallization. Here the crystallography is the driving force. So, in short various aids are prominent and being practiced either to remove the toxic part fully or partially or to convert into nontoxic form. Apart from this, the process reduces particle size and enhances surface area which drives chemical reaction followed by bio chemical activities.

DISCUSSION:

The relevance of the process is to nullify the toxicity and enhancement of bioactivity. This may be contributed either by changing the toxic material or structure to nontoxic form or by eliminating the dreadful part. This also changes the physical state of the material and hence enhancing surface area which is a driving factor in further procedures like calcination or similar pharmaceutical process.

CONCLUSION:

Since materials possesses with various types of toxic characters, detoxification (shodhana) is necessary prior to the preparation of medicine. Hence the classical process shodhana is adopted during classical age itself. Either herbal or mineral materials have the tendency of poisonous characters in specified condition. So in short this shodhana (purification) process enhances the desired chemical properties and nullifies toxic character. Hence every drug should be subjected to shodhana process first.

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